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Published in:
Book of Abstracts. DTU's Sustain Conference 2015

Publication date:
2015

Document Version
Publisher's PDF, also known as Version of record

LAR-potentiale:
a new planning tool to support sustainable stormwater management

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Stormwater management systems are essential for creating and maintaining safe and healthy cities. Current challenges to these systems include climate change, growth and densification of cities, and an increase in demands for sustainability and livability. Among the suggested solutions is a suite of decentralized stormwater control measures known as e.g. Water Sensitive Urban Design (WSUD), which aim at improving the sustainability of stormwater management by applying a more holistic and multifunctional approach. Unlike traditional stormwater planning, WSUD must bring together drainage engineers with city planners, architects and other professionals. We have developed a new tool to support this interdisciplinary collaboration.

The tool facilitates a fast and simple quantification of the core hydrologic effects of a suggested WSUD retrofitting plan. We use the following two key indicators to represent the hydrologic effects of WSUD: 1) the runoff volume/return period at the single event scale, and 2) the water balance impact at the annual scale. The significance of the first indicator is illustrated using the “Three Points Approach”, which has a proven ability to improve conversations about how well different drainage solutions meet expectations. The significance of the second indicator is illustrated against typical annual water budgets, emphasizing the potential for restoring a more natural hydrological cycle and managing pollution on site.

The tool includes simple methods for assessing these effects for a number of different WSUD techniques including permeable paving, rain gardens and detention basins. Local constraints, such as the available area for collection of rainwater and the soils infiltration capacity, are taken into account. We will present the tool using an example application on a case study in Copenhagen. Danish cities are investing large amounts of resources in urban infrastructure renewal, and actors are eagerly waiting for tools like this to more effectively prioritize their spending.

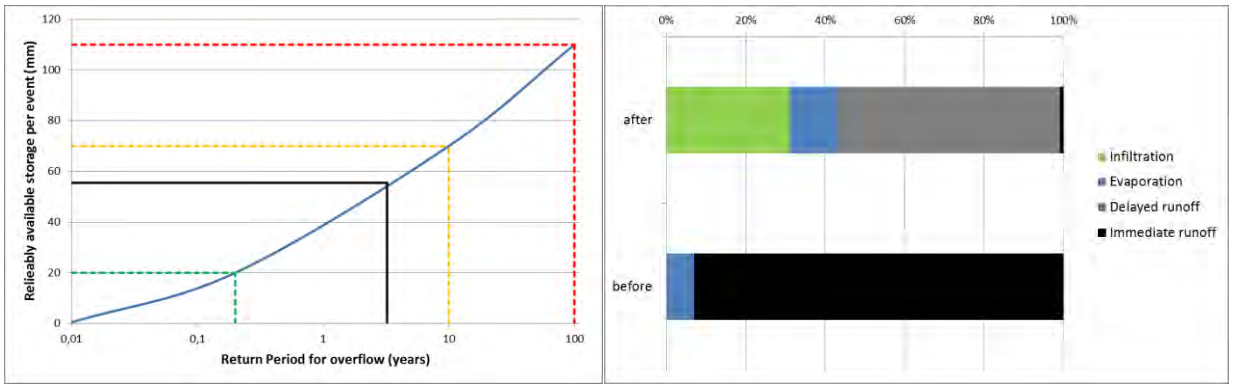

Figure 1: Example outputs. To the left: Key indicator 1 – volume of runoff/return period at the single event scale. To the right: Key indicator 2 - annual water budget before and after.